

WHAT IS CLAIMED IS:

1. A data loop extension for a communication system, comprising:
 - a symmetric bi-directional transmission line having a first end and a second end;
 - 5 a remote termination unit coupled between the first end of the transmission line and a plurality of customer premise equipment, the remote termination unit configured to receive a plurality of ATM data from each customer premise equipment over a respective ADSL link for transmission over the transmission line;
 - 10 a line card coupled to the second end of the transmission line configured to receive the ATM data transmitted from the remote termination unit over the transmission line; and
 - 15 at least one repeater coupled between the first and second end of the transmission line configured to detect the ATM data received from the remote termination unit and to regenerate the ATM data for transmission to the line card.
2. The system of claim 1 wherein the repeater and the remote termination unit are line powered over the transmission line.
3. The system of claim 1 wherein the repeater is a symmetric straight-through repeater, and further, wherein the repeater is configured to detect ATM data received from either the first or the second end of the transmission line, and to regenerate the ATM data for transmission to the respective other of the first and second end of the transmission line.
4. The system of claim 1 wherein the transmission line supports G.shdsl PAM-16 coding and supports a transmission rate of approximately 1.544 Mbps.
5. The system of claim 1 wherein the transmission line is a 26 gauge bi-directional single twisted copper pair, and further, wherein the distance between each ADSL link between the line card and the customer premise equipment is approximately 41,000 feet.

6. The system of claim 1 wherein each ATM data is 53 bytes in length.

7. The system of claim 1 further including a power supply unit coupled to the line card configured to provide approximately 30 watts to the transmission line.

8. The system of claim 1 further including an alarm card unit coupled to the line card for providing alarm information.

9. The system of claim 8 wherein the alarm information includes information related to data channels out of service.

10. The system of claim 1 further including a second repeater coupled between either of the first and second ends of the transmission line and the at least one repeater, wherein the distance between the second repeater and the at least one repeater is approximately 9,000 feet.

11. A method of providing a data loop extension in a communication system, comprising the steps of:

20 providing a symmetric bi-directional transmission line having a first end and a second end;

coupling a remote termination unit between the first end of the transmission line and a plurality of customer premise equipment, the remote termination unit configured to receive a plurality of ATM data from each customer premise equipment over a respective ADSL link for transmission over the transmission line;

25 coupling a line card to the second end of the transmission line configured to receive the ATM data transmitted from the remote termination unit over the transmission line; and

coupling at least one repeater between the first and second end of the transmission line configured to detect the ATM data received from the remote termination unit and to regenerate the ATM data for transmission to the line card.

12. The method of claim 10 further including the step of line powering the at least one repeater and the remote termination over the transmission line.

5 13. The method of claim 10 wherein the repeater is a symmetric straight-through repeater, and further including the step of detecting ATM data received from either the first or the second end of the transmission line, and regenerating the ATM data for transmission to the respective other of the first and second end of the transmission line.

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14. The method of claim 10 wherein the transmission line supports G.shdsl PAM-16 coding and supports a transmission rate of approximately 1.544 Mbps.

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15. The method of claim 10 wherein the transmission line is a 26 gauge bi-directional single twisted copper pair, and further, wherein the distance between each ADSL link between the line card and the customer premise equipment is approximately 41,000 feet.

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16. The method of claim 10 wherein each ATM data is 53 bytes in length.

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17. The method of claim 10 further including the step of coupling a power supply unit to the line card to provide approximately 30 watts to the transmission line.

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18. The method of claim 10 further including the step of coupling an alarm card unit to the line card for providing alarm information.

19. The method of claim 18 wherein the alarm information includes information related to data channels out of service.

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20. The method of claim 1 further including the step of coupling a second repeater between either of the first and second ends of the transmission line and the at least one

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repeater, wherein the distance between the second repeater and the at least one repeater is approximately 9,000 feet.